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"Can I locate you my friend?"-A Cordova Application using Global Positioning System

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ABSTRACT: The Friend locator application that uses GPS enhances the accuracy of locating friends and family member's locations by using inbuilt GPS in smart phone devices of various platforms and PhoneGap technology to create a hybrid application. This system includes a mobile client, a repository and a map service. The mobile client is used to find location and send anAlert message to user when his/her friends or family members are away and needed to be tracked. This location information can be sent to the cloud server of Firebase and the same information can be managed and viewed using this same application on both user's and friends' mobile device.

KEYWORDS: Google Maps, Alert Message, Friend Locator, Global Positioning System (GPS), PhoneGap, Firebase.

I. INTRODUCTION

With rapid development of mobile internet technology and wide usage of Smart Phones, more attentions have been given to network access techniques and interactive applications through mobile phones. Android which is an opensource has become most popular smart phone used by people. In recent years, more and more people have started using the smart phone, laptop, PDA and other mobile devices.

The number of smart phone users is expected to reach two billion by 2015. Tracking or detecting the location of people is very important for various reasons such as identifying the culprit, to notify friends about serious issues, to convey an important message etc. For this purpose, Global Positioning System (GPS) is being used widely. This paper proposes the Location Detection system using PhoneGap technology that makes application compatible withAndroid, iOS, blackberry or any other operating system, and can be used to track friends and family members.

The paper gives the related work in section II. The proposed system is described in Section III, the pseudocode is given in section IV, the simulation results are explained in section V, conclusion and future work is given in section VI.

II. RELATED WORK

Mahesh Kadibagil [1] describes a system for "Position Detection and Tracking System" in which every time user's friend come within a predefined radius a pop up message is sent to user telling him/her that the user's friend is nearby. Paulo R. M. de Andrade [2] is comparative study for multiple platforms. By using PhoneGap technology how an application can be created and be useful in today's scenario.

Lashkari A.H.et. al. [3] describes a system which is used to locate friends and family by using GPS and Standard web technology. This system is implemented using J2ME & JavaScript, the repository and the web client is implemented using PHP and MySQL. Available Android location services like GPS technology, wireless and mobile towers are used to find an approximate location of a mobile phone running this program and then sharing the location information through the Meet You or via SMS.

Kumar N. [4] describes a system using which you can locate the mobile device using another mobile device by even sitting at your home. The system only requires the inbuilt GPS and GPRS in the device whose location is to be tracked."Where are you? – A Location Awareness System" is a project that helps you to locate a friend or a known person without informing that person.

Li Liu.et. al. [5] explains the design and implementation of Android mobile operating system based group communication and navigation system. By use of GPS and Google Map, the system implements a geographic location

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and route planning between user and his friend. The system provides a convenient and efficient platform for users travel and connection between friends.

Shrestha R.et. al. [6] presents android-based location and message sharing system which provides a secured two-way communication between web server and android based application. The proposed system uses Java programming language for android mobile user application, PHP programming language as web server, MySQL as external database to store the data. Symmetric cryptography is used to assure secured communication between android device and web server.

Chandra A.et. al. [7] discusses Location Based Service which is a key factor for future mobile application. The system is developed with J2ME API based on providing location based service using GPS. The application is implemented as client server system which helps users to locate friends and family with whom he wants to share his location. Al Suwaidi G Bet. al. [8] presents Location Based Services (LBS) for mobile applications using Global Positioning System (GPS).

The application is implemented as a client-server system that helps users to locate their family members and receive alerts when friends are nearby. Mobile application developed using J2ME API at client side and Server was implemented using PHP and Database MySQL which is open source. J Jayashree.et. al. [9] proposes a mobile location tracking application in a cellular mobile network based on Location Based Service. The proposed system is implemented as a client server system that helps the users to locate their friends and receive alerts whenever they are nearby.

III. PROPOSED ALGORITHM

A. Design Considerations:

The paper describes location detection system which has the following three objectives:

- Develop a hybrid application which can be used to locate the position of the friends and family members.
- This application has SMS system to verify the user's phone number for security reasons.
- The data is stored in a Firebase Database system i.e. on a cloud server.

Some advantages are:

- End User tracks his/her own location.
- User can track location of friends and family member.
- It can be used for a social media network.

Some Disadvantages are:

- Network connection is necessary.
- Application can be used with GPS enabled handset.

B. Description of the ProposedSystem:

The GPS Friend Locator system is an application based system that uses PhoneGap technology to build a hybrid application that can be compatible on any smartphone device having android 5 and above with a GPS enabled device. The application stores and access its data from Firebase database that is its own cloud server and helps to retrieve and update any information in real time, making our application more reliable. The user has to log in first with his/her own number and once the user's number is verified then the user is able to get his/her friends' location information through Google Map service.

Various inbuilt API's of PhoneGap are used like,*phonegap-googlemaps-plugin*, in this application.
The user can create of blacklist of persons that he/she don't want him/her to locate. The friend's or colleagues list can be created by the user manually or by user's mobile device local storage contact list.

The user can invite the person he/she wants to track by sending a SMS request to that user asking for permission to track/him/her. Once the user at the other end accepts the request of his/her friend the he can be located on the map with his/her exact location. If the invite request is rejected the friends' numbers gets stored in the blacklist of user's phone.

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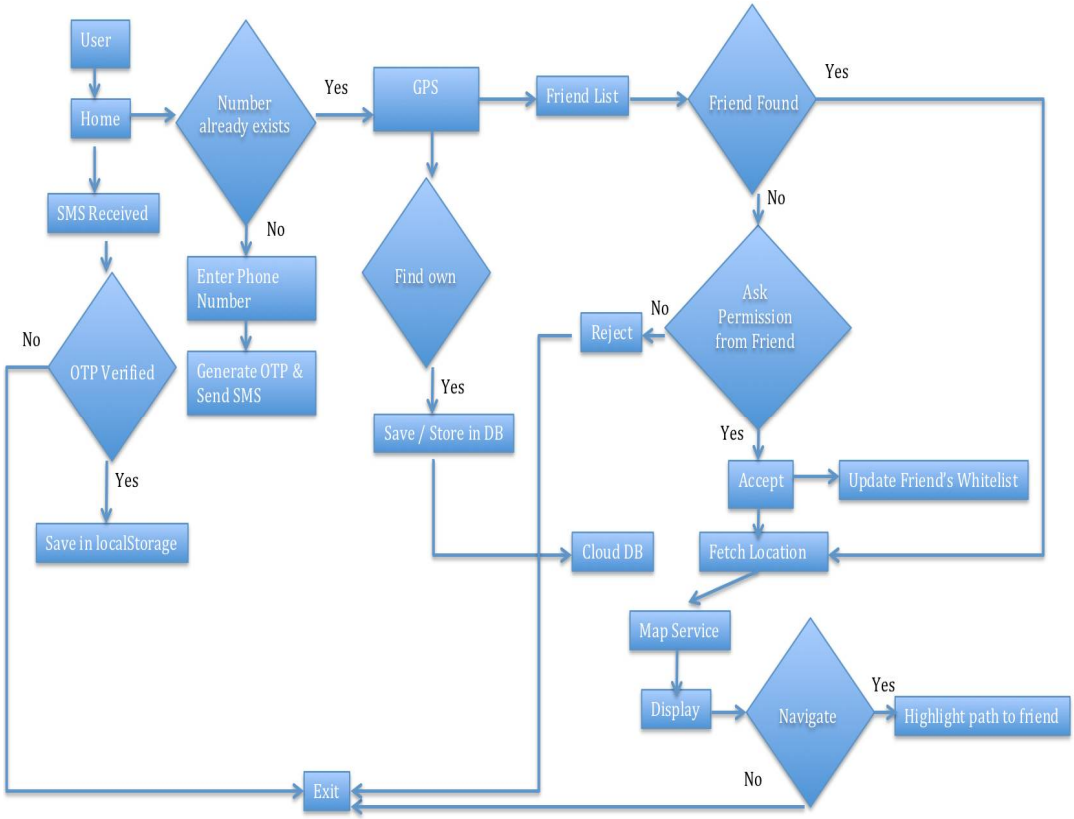

Fig.1. Data Flow Diagram of GPS Friend Locator

IV. PSEUDO CODE

Step 1: Login with the user's phone number.
Step 2: Phone number gets verified using a randomly generated one-time-password using the phone's network SMS server.
Step 3: If phone number gets verified
Take user to the google map service and pin point the user's location on the map
Else
Alert the user that phone number not verified.
Step 4: User can update his/her profile by a picture of his and find his /her location in the form of latitude and longitudes.
Step 5: User's phonebook gets automatically updated by the user's contact book on the device from its local storage.
Step 6: User finds the friend or family member he wishes to track and locate him/her on the map.
Step 7: User invites the friend /family member by sending an alert message.
Step 8: If, the user at other end accept the locate me request
The contact book of user's phone gets updated
Else
The invite request gets rejected and the person name gets stored in blacklist.
Step 9: Step 6 can be repeated as many times user wants.
Step 10: The last updated location of the friend/family member will be stored in Firebase database when the application is last used by the user.
Step 11: End.

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V. SIMULATION RESULTS

The simulation results show how the application progresses. Proposed system compares between two systems that detect and locate the person's position. The "Position detection and Tracking system alerts the user using a popup message whenever the user's friend or family member is nearby. Our results show that the system we proposed is much more realistic on the basis of time and position and gives accurate information of any person's location.

The image showed in Fig. 2 and Fig. 3 is the introductory page of our application. Previous works use pop up messages to alert the user when the his/her friend or family member is nearby and within the range of 1 Kms of radius.

Entry Page: This page lets user to enter phone number and name. The phone number is verified by generating random OTP and verifying through a SMS.

Fig. 2. Entry page

Profile Page: This page displays the user profile. User can update a picture of his/her. And user's own location is shown here.

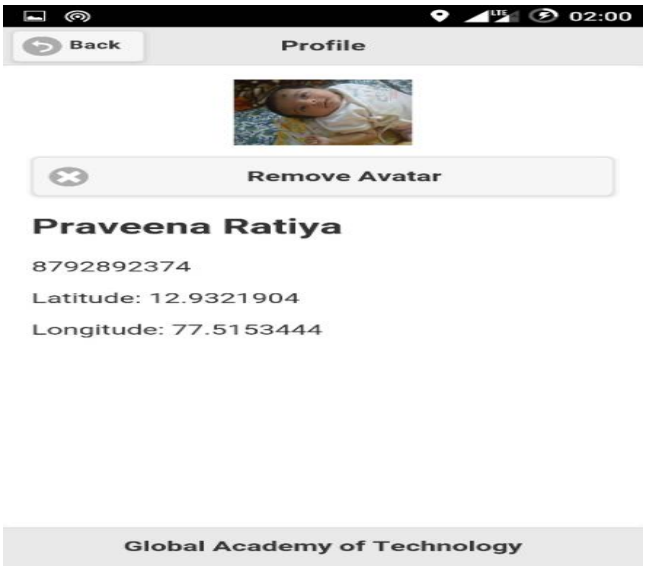

Fig. 3. Profile Page

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Invite Page and Colleagues Page: This page has all the entries of user's contact list to let user invite any of his/her friend to ask him/her to use this application. Any of this friend from use's phone list can be added to application's contact list. User asks for permission to this person and after permission is granted that person is tracked.

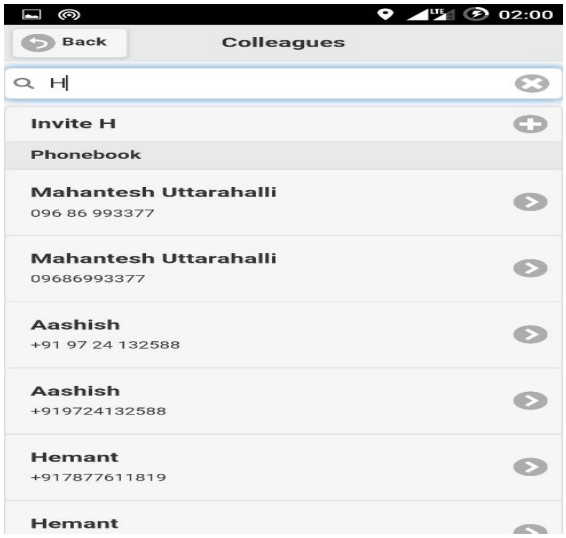

Fig 4. Colleagues list & Invite list

Tracked friend: Finally, the friend who is being tracked is shown on the map with its real time location.

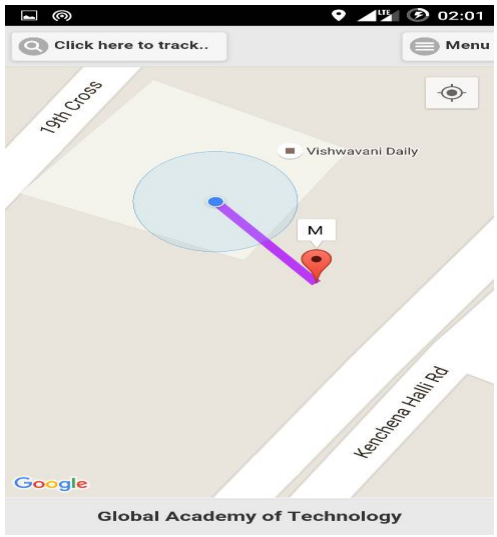

Fig 5. Tracked Friend

VI. CONCLUSION AND FUTURE WORK

The proposed system uses GPS and PhoneGap Technology in order to enhance the positioning experience. The location detection and tracking system effectively helps user tolocate a person using mobile phone. This location and position of person information can be stored in cloud server of Firebase and can be accessed in real time. As a future work, the proposed system can be implemented to navigate the user to his/her friends' location on google maps with voice guidance and using the shortest path on Google Maps service.

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BIOGRAPHY

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